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Building & Highway Material Testing Laboratory
An ISO 9001:2008 Certified Company
NABL - Accredited Laboratory as per ISO / IEC-17025 : 2005

Job No.: CTCE/BBMP/W.No.03/BBU/SDBC/AIV/2015-16 15.03.2016

Aggregate Impact Value

IS: 2386 Part IV

Customer	**Asst. Executive Engineer,** Yelahanka Satellite Town Sub Division, BBMP, Bangalore.
Agency	**Mr. B.B. Umesh,** SMPL Construction and Asphalt, No.02, 1st Floor, Reddy Complex, Mezar Sandeep Unnikrishnan Road, Attur Layout, Bangalore – 106.
Name of the Work	Providing and asphalting to balance road and providing and laying pipeline in Chitra Layout in Attur Ward No.03, BBMP, Bangalore.
Reference	BBMP/AEE/YSSD/08/2015-16 Dated: 29.02.2016
Source / Location	Hot Mix Plant, Bangalore
Type of Mix	Semi Dense Bituminous Concrete
Date of Testing	15.03.2016

Sl No.	Details	Trial No. 1	Trial No. 2	Average
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	382	383	
2	Weight of agregate passing 2.36 mm sieve after the test = W_2 g	82	83	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	300	300	
4	Aggregate Impact value = percent fines $100^* (W_2/W_1)\%$	21.47	21.67	21.57

Comments:

→ Maximum allowable Aggregate Impact value for Semi Dense Bituminous Concrete is 27%

Note:

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Job No.: CTCE/BBMP/W.No.03/BBU/SDBC/Shape_T/2015-16 15.03.2016

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Customer	**Asst. Executive Engineer,** Yelahanka Satellite Town Sub Division, BBMP, Bangalore.
Agency	**Mr. B.B. Umesh,** SMPL Construction and Asphalt, No.02, 1st Floor, Reddy Complex, Mezar Sandeep Unnikrishnan Road, Attur Layout, Bangalore – 106.
Name of Work	Providing and asphalting to balance road and providing and laying pipeline in Chitra Layout in Attur Ward No.03, BBMP, Bangalore.
Reference	BBMP/AEE/YSSD/08/2015-16 Dated: 29.02.2016
Technical Reference	IS 2386(Part 1) 1963 (RA 2007)
Type of Mix	Semi Dense Bituminous Concrete
Date of Testing	15.03.2016

Result : Flakiness Index = **12.35%**

Elongation Index = **13.85%**

Result : Combined Flakiness & Elongation index **26.20%**

Comments:

→ Maximum allowable Flakiness & Elongation Index for Semi Dense Bituminous Concrete is 30%

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Job No.: CTCE/BBMP/W.No.03/BBU/SDBC/Stripping/2015-16 16.03.2016

Stripping Value of Road Aggregates (Static Immersion Test)

IS: 6241

Customer	**Asst. Executive Engineer,** Yelahanka Satellite Town Sub Division, BBMP, Bangalore.
Agency	**Mr. B.B. Umesh,** SMPL Construction and Asphalt, No.02, 1st Floor, Reddy Complex, Mezar Sandeep Unnikrishnan Road, Attur Layout, Bangalore – 106.
Name of the work	Providing and asphalting to balance road and providing and laying pipeline in Chitra Layout in Attur Ward No.03, BBMP, Bangalore.
Reference	BBMP/AEE/YSSD/08/2015-16 Dated: 29.02.2016
Type of Mix	Semi Dense Bituminous Concrete
Date of Testing	16.03.2016

Type of binder : 60/70
Percentage of binder used : 5.0% by wt.
Total weight of aggregate : 200 g
Total weight of binder : 10.0 g
Temperature of water-bath : 40° C

Observation Number	Stripping, Percentage	Average, Percentage	Average Retained Coating, %
1	3.1	3.20	96.80
2	3.2		
3	3.3		

Comments:

→ Minimum allowable Aggregate retained coating for Semi Dense Bituminous Concrete is 95%

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Job No: CTCE/BBMP/W.No.03/BBU/SDBC/Sp_Wa/2015-16 16.03.2016

Specific Gravity And Water Absorption Test

IS: 2386 Part III

Customer	**Asst. Executive Engineer,** Yelahanka Satellite Town Sub Division, BBMP, Bangalore.
Agency	**Mr. B.B. Umesh,** SMPL Construction and Asphalt, No.02, 1st Floor, Reddy Complex, Mezar Sandeep Unnikrishnan Road, Attur Layout, Bangalore – 106.
Name of the Work	Providing and asphalting to balance road and providing and laying pipeline in Chitra Layout in Attur Ward No.03, BBMP, Bangalore.
Reference	BBMP/AEE/YSSD/08/2015-16 Dated: 29.02.2016
Type of Mix	Semi Dense Bituminous Concrete
Source / Location	Hotmix Plant, Bangalore
Date of Testing	16.03.2016

Sl. No.	Details	Notation	Test Number			Mean Value
			Test 1	Test 2	Test 3	
1	Weight of aggregate suspended in water with the basket	W_1 g	2021	2022	2023	
2	Weight of basket suspended in water	W_2 g	750	750	750	
3	Weight of saturated aggregate in water	$(W_1 - W_2) = W_3$ g	1271	1272	1273	
4	Weight of saturated surface dry aggregate in air	W_3 g	2015	2016	2017	
5	Weight of water equal to the volume of the aggregate	$(W_3 - W_4)$ g	744	744	744	
6	Weight of oven dried aggregate	W_4 g	1999	2005	2001	
7	Specific Gravity	$W_4/(W_3-W_4)$	2.687	2.695	2.690	2.690
8	Apparent Specific gravity	$W_4/(W_4-W_4)$	2.746	2.735	2.749	2.743
9	Water Absorption	$((W_3-W_4)*100)/W_4$	0.80%	0.55%	0.80%	0.72

Comments:

→ Maximum allowable Aggregate Water absorption value for Semi Dense Bituminous Concrete is 2.

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Job No.: CTCE/BBMP/W.No.03/BBU/SDBC/AGG/2015-16 16.03.2016

Aggregate Gradation Test

IS : 2386 Part I

Customer	**Asst. Executive Engineer,** Yelahanka Satellite Town Sub Division, BBMP, Bangalore.
Agency	**Mr. B.B. Umesh,** SMPL Construction and Asphalt, No.02, 1st Floor, Reddy Complex, Mezar Sandeep Unnikrishnan Road, Attur Layout, Bangalore – 106.
Name of the Work	Providing and asphalting to balance road and providing and laying pipeline in Chitra Layout in Attur Ward No.03, BBMP, Bangalore.
Reference	BBMP/AEE/YSSD/08/2015-16 Dated: 29.02.2016
Sample I / D	Hot Mix Plant, Bangalore
Type of Mix	Semi Dense Bituminous Concrete (SDBC)
Date of Testing	16.03.2016

Total Weight of Sample: 5450 gm

SIEVE SIZE, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	Grade-II As per MORTH	Remarks
13.2	0	0.0	0	100	100	Gradation satisfies Grade II MORTH specification
9.5	450	8.3	8.26	91.74	90-100	
4.75	2970	54.5	62.75	37.25	35-51	
2.36	650	11.9	74.68	25.32	24-39	
1.18	425	7.8	82.48	17.52	15-30	
0.3	365	6.7	89.17	10.83	9-19	
0.075	330	6.1	95.23	4.77	3-8	

Total Weight of Sample: 5600 gm

SIEVE SIZE, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	Grade-II As per MORTH	Remarks
13.2	0	0.0	0	100	100	Gradation satisfies Grade II MORTH specification
9.5	385	6.9	6.88	93.13	90-100	
4.75	2960	52.9	59.73	40.27	35-51	
2.36	615	11.0	70.71	29.29	24-39	
1.18	450	8.0	78.75	21.25	15-30	
0.3	350	6.3	85.00	15.00	9-19	
0.075	490	8.8	93.75	6.25	3-8	

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Job No.: CTCE/BBMP/W.No.03/BBU/SDBC/Stability/2015-16 16.03.2016

TEST REPORT ON STABILITY OF MIX

Customer	:	**Asst. Executive Engineer,** Yelahanka Satellite Town Sub Division, BBMP, Bangalore.
Agency	:	**Mr. B.B. Umesh,** SMPL Construction and Asphalt, No.02, 1st Floor, Reddy Complex, Mezar Sandeep Unnikrishnan Road, Attur Layout, Bangalore – 106.
Name of the Work	:	Providing and asphalting to balance road and providing and laying pipeline in Chitra Layout in Attur Ward No.03, BBMP, Bangalore.
Reference	:	BBMP/AEE/YSSD/08/2015-16 Dated: 29.02.2016
Source of location	:	Hot mix Plant, Bangalore
Type of Mix	:	Semi Dense Bituminous Concrete
Date of Testing	:	16.03.2016

The results of the tests conducted on the bituminous concrete mix sample are as follows:

Sl. No	Description	Test Result 1	Test Result 2	Requirement as per MORTH (Table 500-16)
1	Marshal Stability, Kn	8.30	8.45	8.2 Kn (min)
2	Marshal flow, mm	2.55	3.010	2 – 4
3	Percent air voids in Mineral Aggregate	3.25	3.60	3 – 5
4	Voids in Compacted Mix	13.10	13.90	13 – 15
5	Percent Voids filled with Bitumen	66.85	66.90	65 - 78
6	Density, g/cc	2.25	2.26	--

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